Contribution ID: **27** Type: **not specified**

A bright (near) future in the PeVatron era with the ASTRI Mini-Array

Despite the enormous efforts done in very recent years, both theoretically and experimentally, the basic three questions about the Cosmic Ray (CR) origin remain without clear answers: what are their sources, how are they accelerated, how do they propagate?

Gamma-ray astronomy plays a fundamental role in this field. Both relativistic protons and electrons can emit in the gamma-ray band through different processes but only the detection of hadronic gamma-ray emission can probe CR acceleration. The recent results published by the LHAASO collaboration revealed the existence of several PeV sources. Most of them are likely related to pulsars, well known leptonic factories, and/or their nebulae, PWNe (e.g. the Crab Nebula for all), the only sources where we expect to see electrons accelerated up to PeV energies. Consequently, a gamma-ray detection at these energies still cannot be considered the final proof of hadronic acceleration. Furthermore, the limited angular resolution of LHAASO at TeV scale makes associations uncertain and, thus, more detailed and deeper studies are needed.

In this context, the ASTRI Mini-Array can play a fundamental role. The first three telescopes will be operative by fall 2023 and the full array of nine telescopes in 2025. With its unprecedented sensitivity and angular resolution in the multi-TeV band with respect to the existing IACTs, not only this instrument can extend the gamma-ray spectra of candidate PeVatrons but it can also help to distinguish whether the emission is actually connected with pulsars/PWN systems, shedding light on the nature of the highest energies emission.

Primary author: CARDILLO, MARTINA (IAPS-INAF)

Presenter: CARDILLO, MARTINA (IAPS-INAF)

Session Classification: PeV Accelerators: Alternative source types and large-scale diffuse emission